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ABSTRACT

This study evaluates the effects of a family development project implemented in Uyanwatta, a poor rural village in Kandy district, Sri Lanka, on the academic achievement of at-risk elementary school students. Specifically, the study examined the level of mother's involvement in enriching the family environment and its impact on children's academic achievement. Lack of motivation, lack of family support for formal learning, poor economic conditions, and household chores were identified as major parent-related factors that hinder children's performance at school. In addition, research suggests that positive parenting is associated with relatively high levels of children's social and academic competence. Participants in the study included 25 uneducated, unemployed mothers in low-income families, whose children were in the fourth grade. Based on family demographic profiles, more than 90 percent of the families in the village were living in poverty and the children were considered educationally at risk. Mothers participated in learning and discussion groups concerning five domains of family environment: family income, health and nutrition, learning facilitation, family interaction, and mother-child interaction. A measure of childrens' mathematics and language achievement levels was administered prior to and following the 12-week intervention program. The program also involved home observations and interviews to evaluate the level of mothers' involvement in the program. Data indicate a significant gain in children's language and mathematics skills. In addition, observations and interviews revealed that mothers were positively involved in enriching the five domains of family environment, particularly family income and health and nutrition. Contains 56 references and data tables. (LP)

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Family and Child Development Project in the Village of Uyanwatta in Sri Lanka

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FAMILY AND CHILD DEVELOPMENT PROJECT IN THE VILLAGE OF UYANWATTA IN SRI LANKA

This study examined the importance of educating low income unemployed mothers to develop their family environment which would enhance their children's academic achievement. The study was conducted as a part of a longitudinal family development project in Uyanwatta village, a rural area in the District of Kandy in Sri Lanka. The village socio-economic standard in Sri Lanka is very much lower compared to that of urban areas. The Uyanwatte village population come under the category 'poor'. Landless agricultural workers, small land owning peasants who cultivate food crops using family labor, workers in small scale (often cottage type) rural industries, small traders, and individually operating craftsmen like carpenters form a dominant proportion of the poor (Alailima, 1986; Bhalla & Glewwe, 1985; Edirisinghe, 1990; Marga, 1981). The literacy rate in Sri Lanka is 88% (IBRD, 1993) while the school drop out rate is 4.7 at the end of the Primary Cycle (Kularatna, Dharmadasa & Dharmawardana, 1990). Lack of motivation, lack of support given within the family for formal learning, poor economic conditions and household chores are identified as major parent-related causes that hinder children's performance at school (Kularatna, Dharmadasa & Dharmawardana, 1990). In rural areas socio-economic factors are dominant in contributing to the child's academic

performance (Jayasundara, 1980; Kularatna, 1989; Punchinilame, 1979). On the basis of nutrition adequacy, the District of Kandy has been classified under the category 'very bad' (UNICEF, 1985). The problems of malnutrition, unemployment, use of resources, self reliance, etc. remain unsolved in rural areas (NIE, 1990).

The father is the primary bread winner of the family. The mother spends most of her time at home looking after the children and attending to the work at home. She has also to contribute to the family income substantially, depending on the type of the husband's occupation and his income. Most of the disadvantaged mothers in rural areas are unable to provide their children with a healthy home environment and guidance required or material support for children's education. The reason may not only be poor income but also the lack of understanding about children's developmental needs (NIE, 1988). The socio-economic factors and early childhood experiences are seen as pre-disposing factors in differential learning levels even among the children of the same age. The question is how to reduce the "deficits" so that the children would better fit into demands of the formal learning (NIE, 1988). These problems are seemingly related to the causes of school achievement of the village children. Kularatna, Dharmadasa and Dharmawardana (1990) have suggested that an overall strategy may have to be conceived in terms of the several measures which seem to indicate the importance of attacking the problem from several directions. An extensive body of research

has taken efforts to show how the family affects children's cognitive and social development. Research reveals different roles that home environments may play in the formation of educational differences between children (Bloom, 1985; Bradley & Caldwell, 1984; Darlington, Royce, Snipper, Murray, & Lazar, 1980; Ginsburg et al., 1986; Schwenhart & Weikart, 1980). Studies on family influences have found that the more wholesome the home environment the more developed are children's abilities across domains. Children's family environments help to determine the domains in which they will acquire rich and well structured knowledge (Price, 1984). Formal instruction and informal social interaction provide the child with a model of an expert applying appropriate background information to a new problem, thereby giving the child experience in the skillful generalization of knowledge to new problems (Vygotsky, 1978). The mother is a strong mediating factor related to a child's achievement (Brown 1979; Bruner, 1985; Cole & Griffing, 1980; Eavenson & Gorrell, 1991; Pellegrino et al., 1985; Rogoff & Gardner, 1984; Vygotsky, 1978; Wertsh, 1979; Wood, 1980). Research bears evidence that positive parenting is associated with relatively high levels of children's social and academic competence (Pettit, Bates & Dodge, 1988).

Considerable research suggests that parents play a major role in facilitating children's academic development (Cowan, Cowen, Schulz & Heming, 1994; Epstein, 1989; Pratt et al., 1992). Parent behavior is related to child's intellectual development

and academic achievement (Carew, 1980; Hess, 1969; Hess, Hollwoey, Dickson & Price, 1984; Marjoribanks, 1979; Portes, 1991). Family risk factors and problems of children have been linked to poor learning outcomes of children (Luster & McAdoo, 1994). Maternal low educational attainment (Dubow, & Luster, 1990; Furstenberg, Brooks-Gunn & Morgan, 1987; Sameroff et al., 1987)and low self-esteem (Dubow, & Luster, 1990; Rutter, 1978; Samroff et al., 1987; Wordsworth, Taylor, Osborn & Butler, 1984; Werner, 1985) are related to children's academic achievement. Studies also support the fact that mothers with low intellectual ability tend to provide a less supportive environment for their children (Longstereth et al., 1981; Luster, & Dubow, 1992; Yeates et al., 1983). Poverty has an impact on family processes that affect the child's outcome; it often diminishes the capacity for supportive, consistent parenting and affects children's experiences in the setting outside the home (Dubow, & Luster, 1990; Furstenberg, Brooks-Gunn & Morgan, 1987; Luster, & McAdoo, 1994; McLoyd, 1990; Werner, 1985; Wordsworth, Taylor, Osborn & Butler, 1984). Grolnick and Slowiaczak (1994) and Patterson et al. (1992) consider the domains of positive parenting and intellectual involvement to be operationalized as the provision of a cognitively stimulating family environment.

Education researchers have made an attempt to identify various factors that relate to children's achievement in school. The majority of them have focused their attention primarily on maternal variables or maternal behavior and its relationship to

the child's social and cognitive competencies. Kalinowsky and Sloane (1981) state that they have failed to account for the mechanisms that link family environment with school performance. Positive parenting is multifaceted and consideration of these separate facts can lead to further understandings of the connection between parental behavior and child outcomes (Grolnick, & Slowiaczek, 1994; Patterson et al., 1992). Luster and Okagaki (1993) state that parenting behavior will be enhanced if we consider the combined influence of several factors rather than thinking about each factor singly. They point out the value of examining several potentials influencing parental behavior. Cowan, Cowen, Schulz and Heming (1994) press on the point for the need of more integrative approaches despite the lack of extensive background information. This further confirms the suggestion of Kularatna, Dhrmadasa & Dharmawardana (1990) for attacking the problem from several directions. Thus, a considerable body of research reveals that the mother is a critical mediating factor who influences children's scholastic achievement. Although little is known about the effects of involvement of mothers mediating the environmental factors that influence children's scholastic achievement in low socio-economic groups, in developing countries a large amount of family and child risk factors prevail.

Based on findings of past research on social and cognitive theoretical backgrounds an attempt was made to develop an integrative research model. It proposes the hypothesis that educating low income mothers to enrich their family environment

may enhance children's scholastic achievement. In order to test this hypothesis five different elements were assessed: family income, health & nutrition, learning facilitation, family interaction and mother-child interaction. The objective of this study was to examine relevant information related five-domain wise contributions, over time contributions, interaction patterns between domains and time, and the impact of these three factors on children's academic achievement.

Method

Sample

The sample for this study consisted of 25 uneducated, unemployed mothers in low income families (with an income of less than 1000.00 rupees per month, equivalent to about $21.00), who were in the family project and 25 of their children who were in the fourth grade at the village Primary School. Most of these families were in the poverty alleviation Janasaviya (people's strength) welfare program. There was a very large degree of variability in mother support for child learning and quality of mother child interaction in the home environment.

Before selecting the sample of 25 mothers for the project, demographic information was obtained for the total population of mothers in the village about their family environment: how they manage their income, their daily routines, educational standards, family relationships and interactions, health and nutrition, life

style and other family resources. More than 50% of the mothers have not had their education beyond 6th grade and 50% of the sample have children ranging from 4 to 10. All mothers were living with their husbands except one single mother whose husband had died in an motor accident. Three of the husbands were sick and unable to earn anything for the family economy. Nearly 40% of working husbands were temporary daily wage earners.

Fifty percent of the houses were with 3 or 2 sections including a small kitchen and the living room with 6-12 family members living in them. The room area in most houses was approximately 12' X 12'. Mothers who were engaged in small scale home businesses had converted one room in the house to a working place or to their boutique (small shop). Eighty percent of the houses had no electricity. Most of these families slept around 7.00 or 7.30 pm when it gets dark, as they could not afford money for kerosine oil to light lamps for long hours. Children studied only in the day time. There was no separate place set apart in the house for children to study. Most of them studied in the common table which the family uses for most purposes. Children had only text books which were provided by the state. Most of the children or their parents had never gone to a library with their parents. Mothers had no idea how to help their children with their studies. Most of them were not so much concerned about children's health, especially in providing them with nutritious food. Based on the family demographic profiles, more than 90% of the sample families in the village were living in poverty and the

children involved in this sample could be considered educationally "at risk". The demographic variables show that our sample sets of mothers and their children were the most underprivileged in the whole village.

Training researchers

Fifteen researchers were intensively trained by specialists in different fields to function as instructors, observers and interviewers. Instructors conducted regular discussion classes, seminars, work sessions and craft projects to educate mothers on the five domains of family environment. The content material included problems of child development, use of educational resources to assist children, improving family health and nutrition, enhancing social interaction and training job oriented skills. Also these instructors functioned as family counselors. Inter observer reliability assessments were conducted and the inter rater reliability was found to be .80.

Constructing instruments and measures

The achievement test and other instruments were designed specially for the project under study. Achievement tests in mathematics and mother tongue (Sinhalese language) were constructed by a panel of experts in elementary education consisting of 4th grade teachers, curriculum makers for primary education, and Teacher College lecturers. They were piloted and tested for validity and reliability. The mother tongue test consisted of four components reading, writing, listening and speaking which emphasized developing primary child's competencies

in the elementary curriculum (Dharmadasa, 1988). The mathematics achievement test was constructed according to the grade 4 curriculum guide, 1985 version (Gunawardana, 1988).

Observation instruments were developed to measure five domains of family environment. An attempt was made to include items that would provide reasonable estimates of mothers' involvement in each domain of family environment. A five point numerical rating scale was used to assess mothers' involvement. Items were coded negative to positive, targeting the involvement of the mother. A rating of "1" indicated the mother was not supportive, no involvement at all. A rating of "5" indicated an extra-supportive environment and highly involvement. The items include observation of behavioral aspects of the mother's involvement in respective domains of family environment. Five composite scores were computed to represent five domains of family environment.

The mother interview was designed to tap mothers' involvement in the areas of five domains of family environment. Open-ended questions were developed for the interview with the intention of getting free responses from each mother's own frame of reference. Observers and the interviewers were trained under the supervision of an instructor. Successful relations were developed with government and non-government institutions to obtained appropriate materials and specialists in different fields for skill training for mother's job oriented activities.

Procedure

To obtain a measure of child's achievement levels in mathematics and mother tongue, pre-tests were administered by two instructors to the fourth graders in the village Primary School before working with mothers and the families. The post-tests were administered in the school at the end of 12 weeks of the mothers' intervention program. The post-test instruments were the same as the pre-test instruments.

The instructors educated the mothers in five domains of family environment by conducting discussion sessions, work shops, seminars, projects, and field work. Mothers were educated to develop their knowledge and skills in five domains of family environment.

In the domain of family income, mothers were taught and trained to engage in small cottage industries such as handi-crafts, flower making, bag weaving, flower and vegetable gardening, flower potting, mushroom growing, dress making, doll making, hair dressing, etc. They were provided with the material to begin small scale industries at home and they were encouraged and guided to obtained financial assistance from various funding agencies and financial institutions. They were instructed how to earn an extra income for the family. Mothers were promoted to engage themselves in some kind of cottage industries with raw material available in the village.

In the domain of health and nutrition, mothers participated in various activities to acquire the necessary knowledge. Mothers

learned to prepare nutritious meals, keep the house clean, follow better toilet habits, arrange rooms in their houses, ways to dispose of waste material, drink boiled water, etc. The mothers were provided with health and nutrition information which enabled them to develop an awareness of their children's health and fitness needs. Film shows and exhibitions were organized on various aspects of child and family health to develop their knowledge in family health, related problems and care for children's health problems.

In the domain of learning facilitation, parent-child learning activities were organized to develop competencies in parents, knowledge on children's learning in the school. Mothers were guided to make use of resources available in the neighborhood such as public libraries and recreation centers to assist their children in their learning tasks. Mothers were given instructions and know-how to prepare a appropriate study place in the house and to get a make-shift table and chair done for the child. The mothers were helped to build up an active role as facilitator of their children's learning and strengthen their relationships with their children.

Instructions were given on family interaction and mother-child interaction domains in a combined context. The mothers were guided to understand and to find appropriate methods to deal with their children's needs and behavior problems. Mothers were given the necessary guidance and know-how to built up a warm positive relationship with the child and the family. The instructors

organized learning situations which would enhance parent's involvement with children in social activities. The mothers were encouraged to participate in community development activities like 'shramadana'(providing free voluntary labor) with children and to share their ideas with others to help to develop close relationships among parents, community members and the children.

Home observations were planned to examine the multiple aspects of the mothers' involvement occurring in more natural home situations. The first round of observations was conducted before actually working with the mothers in the educational and skill development program. The second round of observations was conducted after six weeks of intervention and the third round of observations was done before conducting the achievement post test with the children. Two observers were in the house with the mother and the family for half an hour before making their individual ratings. The observers were thus provided with the opportunity to observe the actual behaviors and normal home environment in a way that would reduce rater error (Guilford 1954). The observers made observations on the mother's involvement in five domains of family environment and rated them on a five-point scale.

Interviews were conducted three times to gather information and monitor family progress. The interviews were conducted on the same week after observations were conducted. Two interviewers participated in the mother interview. One interviewer first

interviewed the mother and recorded the mother's answers verbatim in writing. The second interviewer did not participate in direct conversation with the mother but took down notes on the mother's responses. This was planned as a way of assuring reliability in case misinterpretation occurred. Questions were repeated and their meaning explained when necessary. The interviewer requested additional information when a response was incomplete or irrelevant.

Method of Analysis

Repeated measures t-test statistics were employed to analyze children's achievement scores of pre-test and post-test in mother tongue and mathematics. The norm scores for grade 4 mother tongue and mathematics (Kularatna et al., 1990) were compared with the pre-test and post test means. Repeated measures analysis of variance (ANOVA) and descriptive statistics were used to examine mother's involvement in five domains of family environment, to measure the domain effects, time effects, and domain by time interaction effects and their significance. Follow-up ANOVA and dependent t tests were performed to determine the location of the significant effects. F ratios were compared against a conservative alpha level to avoid even minor violations of the sphericity assumption in repeated measures design that can seriously affect our interpretation of F ratios (Keppel, 1991). A qualitative approach was adopted in the collection and analysis of interview data.

Results

Children's Achievement

Means and standard deviations for each of the two variables mother tongue and mathematics and their respective norm scores are presented in the table 1.

Insert table 1 about here

Post-test means of mother tongue and mathematics are higher than the pre-test means. The mean difference in mother tongue is larger than the mean difference in mathematics. The pre-test mean score of mathematics is much below the norm score for the grade 4. The post-test mean scores for mother tongue and mathematics are far above the norm scores for the two subjects.

These outcomes are confirmed by the t-test values of the pre-test and the post-test in these two subjects. The results of t-tests of children's achievement in mother tongue and mathematics are reported in the table 2.

Insert table 2 about here

The t-test results show a significant outcome in mother tongue ($t = 2.58$, $p < .00$) and mathematics ($t = 12.00$, $p < .00$). The t values for mathematics is higher than the t value for mother tongue.

Mother's observation

Descriptive statistics of 5 domains over 3 times of observations are reported in the table 3.

Insert table 3 about here

Means and standard deviations in each cell show a unique contribution pattern which indicates an increment of loadings within domains with the time. Higher means are seen in all five domains in time 3. It also shows that means for time 3 are much higher than the means for time 1. Means and standard deviations show greater progress in mothers' involvement in all five domains of family environment over time.

Results of repeated measures analysis of variance (ANOVA) revealed significant differences in all three aspects of time, domains, and time by domains respectively (presented in table 4).

Insert table 4 about here

The main effects appear for time, ($F(2, 48)= 712.16$, $p < .001$), domain, ($F(4, 96)= 6.19$, $p < .001$) and time by domain interaction ($F(8, 192)= 22.95$, $p < .001$). Main effects for time much higher than the domain effects and the time by domain interaction effects. Time by domain interaction effects also show a significantly larger value than domain effects. Although the

domain main effect is smaller compared to time effects and the time by domain effects, there is a significant difference over time. Results bear evidence that time effects are of greater significance than the domain effects and the time by domain interaction effects.

A follow-up one way ANOVA was conducted to examine further domain effects with time 1, time 2 and time 3. The results are presented in table 5.

Insert table 5 about here

Domain effects for time 1 ($F(4, 96)= 37.61$, $p < .025$) and time 2 ($F(4, 96)= 4.42$, $p < .025$) show significant domain-wise differences. Follow up dependent t-tests were conducted to see exact estimates of domains pair-wise contributions and their significance for time 1 and time 2. Table 6 reports pair-wise domain effects of time 1 and time 2.

Insert table 6 about here

The t statistics for time 1 shows that (except for time 1 domain 1 with time 1 domain 2, time 1 domain 1 with time 1 domain 3 and time 1 domain 2 with time 1 domain 3) all other paired domains are significant at alpha= .005 level. The t values for time 2 do not show significant differences in domains pair-wise

comparison combinations at alpha = .005 level. The overall domain-wise analyses did not highlight the prominence of the domain effects.

A follow up one way ANOVA was conducted to examine whether the time effects are evident. Analysis of variance for the time effect is reported in table 7.

Insert table 7 about here

Table 7 reveals significant differences over time in all five domains at alpha= .016 level. Reported high F values indicate that time-wise contributions are large. The follow up paired t-tests were conducted to find out specific effects of time in each domain area. The table 8 reports follow-up paired t values for domain effects.

Insert table 8 about here

The data in table 8 reveals that all of the time and domain pair-wise combinations are significant at alpha = .016 level. The follow up tests show that there is a strong time effect on domains and this finding is consistent with the time effects of the findings of the repeated measure ANOVA conducted to examine overall effects of the three aspects of the study, domain, time, and time by domain.

Discussion

Findings of the data analysis stated above indicate that, with the treatment provided to mothers, significantly greater achievement gains occurred in children's mother tongue and mathematics. When comparing the means of the pre-tests and the post-tests with the norm mean scores for grade 4, for the two subjects we find that children's scholastic achievement has accelerated over time with the mothers' treatment.

Insert figure 1 about here

Insert figure 2 about here

Figures 1 and 2, the children's post-test means of mother tongue and mathematics, show an improvement far above the norm score for two subjects. The pre-test mean for mathematics is far below the norm score before the mothers' treatment commenced. The children's post-test achievement scores for mother tongue and mathematics record a wide increase over the pre-test scores.

We know that for mother tongue children need assistance in developing skills for writing and script reading. The mother tongue results report that the mothers were sufficiently involved in these activities within a short period of education and coaching. For mathematics, children need a good learning environment and materials to engage themselves in problem solving

tasks. In primary education, when children are provided with supportive learning environments they perform well in their academic tasks. Hence, we see an increase in mathematic scores when mothers' were involved in helping with children's learning.

By analysis of variance my attempt was to examine the three aspects of domain effects, time effects, and domain by time effects through the observation data set to see whether the mothers intervention program made a difference in children's achievement. Significant F values are found in results of repeated measures ANOVA on the three major aspects of the study, domain, time and time by domain. This finding suggests that mothers were positively involved in enriching the five domains of environment over time. Follow up analysis of ANOVA and t-tests show more closely the specific dimensions of domains related to mothers involvement.

A major issue of importance was to find out what effects would evolve over time through the intervention program. In this sphere follow up analysis revealed significant positive results over time in five domains. It also reveals that the mothers were involved in a positive manner in all five domains of family environment. According to descriptive statistics, a substantial development is reported in mothers involvement in domains over time.

Insert figure 3 about here

Figure 3 reveals an overall picture of the contribution of the five domains and the trend of each domain over time. The steepness of the lines indicates the extent of improvements of mothers' involvement, as a result of the intervention program over the time. All five lines representing each domain indicate a steep rise from left to right. Among the five domains the lines of family income and health and nutrition have gone much higher than other three domain lines. It indicates considerable development has occurred in these two areas.

The interview data provide additional evidence of the positive effects of the intervention. The data point out that by means of skill development activities, the mothers were able to acquire job-oriented knowledge and skills. Seven mothers started small scale cottage industries at home. Six were able to get part-time jobs in relevant fields after following these job oriented programs. Four mothers improved their small scale boutiques to earn a bigger income. All the mothers were able to organize and implement activities which helped them to improve their family socioeconomic status. The periodic trade fairs which were organized to sell the mother's home industry products to the public brought in additional income to the mothers' families. They were able to organize and provide necessary materials and assistance for children's learning.

The interview explains that health and nutrition programs had a great influence on families and their children's health and sanitation. These programs helped to create healthier home

environments. The sum total of the above factors enabled the mothers to eliminate most of the problems they had faced earlier, such as providing three meals a day for the children, good clothes, requirements for learning in the school, keeping the home environment clean, reducing the incidence of children's falling sick, etc. The small business companies in the area provided some of the learning materials for the use of the children.

The interview data revealed that children became more engaged in school-oriented learning activities after the mothers' involvement in the program. The quality of advice that mothers provided for their children after being involved them-selves in the intervention program became more effective in contrast to the advice provided earlier prior to intervention, especially related to learning, and use of time. Patterson and Stouthamer-Loeber (1984) point out that this kind of parental monitoring is an index of how well parents function as providers of opportunities that enhance social and cognitive process.

The interviews conducted provided the opportunity to get an insight into mothers' problems and to find ways to help and promote them towards their progress. Interview data revealed the occurrence of marked improvements in family health, nutrition habits, home environment, and total family income. Mothers were able to develop self-confidence and a sense of self-reliance through their involvement in developing appropriate home environments for their families. The results demonstrate that,

over time, mothers' involvement in enriching the family environment in five domains significantly improved, and during this period of time the children's achievement levels also significantly improved. The mothers' interview data reveal that children seemed to change their behaviors and attitudes towards learning. It favors the hypothesis that educating low income mothers to enrich family environment may enhance children's scholastic achievement.

I made an attempt to analyze data from two different angles: mother's involvement and the child's achievement. The measures of ANCVA and t tests I used may not identify the more sensitive aspects of relationships and contributions between the mothers involvement in enriching the family environment and the children's academic achievement. The present study does not address the mediating factors that are related to children's achievement, such as the impact of children's cognitive processes or the school influences. However this research may provide some insights and lead to solutions to the problems of children's scholastic achievement and to the direction of the influences.

Theoretical and Practical Implications

This study was a primary attempt to highlight the importance of multiple effects of mothers' involvement in enriching the family environment and its impact on children's academic achievement. A complex study of this nature may need complex research designs, numerous instruments, and different measures to access the multiple effects and relationships of the variables

involved. Also, longitudinal studies may provide a path to find out the long term effects of their relationships. As Steinberg, Lamborn, Darling, Mounts and Dornbush (1994) stated, it would be interesting to study families of different ethnic groups in a similar context.

The findings support the theory that children's performance related to school learning can be enriched by providing them with required assistance and resources at home, appropriate mother-child interaction and healthy home and family environment. Newman and Karp (1983) report that even a brief period of parent training is sufficient to improve arithmetic skills of low achieving pre-school children in the short term. Parent education implemented in a Follow Through Program (Rubin et al., 1983) has had a longitudinal positive effect on grade retention and reducing drop-out rates for participants. In spite of limitations, studies such as these suggest that even moderate changes in children's environment may influence changes in intellectual performance. Findings of the present study suggest that it is essential to organize programs that will help low income unemployed mothers to broaden their understanding about child leaning and facilitation. If parents are educated, guided,and assisted through such intervention programs they would be able to provide their children with more support for their school academic achievement.

REFERENCES

Alailima, P. (1986). Survey of the Literature on Poverty. Mimeo.

Bhalla, S., & Glewwe, P. (1985). Living Standards in Sri Lanka in the Seventies: Mirage and Reality. Mimeo.

Bloom, B. S. (1985). Developing talent in young people. New York: Ballentine Books.

Bradley, R. H., & Caldwell, B. M. (1984). The relations of infants' home environments to achievement test performance in First Grade: A follow up study. Child Development, 55, 803-809.

Brown, A. (1979). Theories of memory and the problems of development: activity, growth, and knowledge. In L. S. Cermak & F. I. M. Craic, (Eds.), Levels of processing and human memory. Hillsdale, N.J.: Erlbaum.

Bruner, J. (1985). Vygotsky: A historical and conceptual perspective. In J. V. Wertsch (Ed.), Culture, communication and cognition (pp.24-34). Cambridge: Cambridge University Press.

Carew, J. V. (1980). Experience and the development and intelligence in young children at home and in day care. Monographs of the Society for Research for Child Development, 45, (Serial No. 187) 6-7.

Cole, M., Griffin, P. (1980). Cultural amplifiers reconsidered. In D. R. Olson (Ed), The social foundations of language and thought. New York: Norton.

Cowan, P. A., Cowan, C. P., Schulz, M. S., & Heming, G. (1994). Prebirth to preschool family factors in children's adaptation to kindergarten. In R. D. Parke, & S. G. Kellam (Eds.), Exploring family relationships with other social contexts (pp.75- 114). Hillsdale, New Jersey: Lawrence Erlbaum Associates, Publishers.

Dharmadasa, I. (1988). Language competency. In National Institute of Education, Entry competency of Sri Lankan children (pp. 83-91). Sri Lanka: Maharagam.

Dubow, E. F., & Luster, T. (1990). Adjustment of children born to teenage mothers: The contribution of risk and protective factors. Journal of Marriage and the Family, 52, 393-404.

Eavenson, R. P. & Gorrell, J. (1991, November). The relationship between parent-child interaction and children's academic performance: Review of Research. Paper presented at the Annual Meeting of Mid-South Educational Research Association. Lexington, Kentucky.

Edirisinghe, N. (1990). Poverty in Sri Lanka: Its Extent, Distribution and Characteristics of the Poor. Paper submitted to World Bank, Sri Lanka Poverty Alleviation and Employment Project, Mimeo.

Epstein, J. L. (1989). Family Structures and student motivation: A developmental perspective. In C. Ames & R. Ames (Eds.), Research on motivation in education, Vol.3: Goals and cognitions (pp. 259-293). New York: Academic Press.

Furstenberg, F., Brooks-Gunn, J., & Morgan, S. P. (1987). Adolescent mothers in later life. Cambridge: Cambridge University Press.

Ginsburg, D., Gottman, J. M., & Parker, J. G. (1986). The importance of friendship. In J. M.Gottman & J. G. Parker (Eds.),Conservations of friends (pp.3-49). Cambridge, England: Cambridge University Press.

Grolnick, W. S., & Slowiaczek, M. L. (1994). Parent's involvement in children's schooling: A multidimensional conceptualization and motivational model. Child Development, 65, 237-252.

Gunawardane, A. J. (1988). Math competency. In National Institute of Education, Entry competency of Sri Lankan children (pp. 159-167). Sri Lanka: Maharagama.

Guilford, J. P. (1954). Psychometric Methods. New York: McGraw-Hill.

Hess, R. D. (1969). Parental behavior and children's school achievement; Implications for Head Start. In E. Grotberg (Ed.), Critical issues in research related to disadvantaged children. Princeton: Educational Testing Service.

Hess, R. D., Holloway, S. D., Dickson, W. P., & Price, G. G. (1984). Maternal variables as predictors of children's school readiness and Later achievement in vocabulary and mathematics in sixth grade. Child Development, 55, 1902-1912.

International Bank for Reconstruction and Development (1993). World Bank Development Report 1993. New York: Oxford University Press.

Jayasundara, E. (1980). Wastage at school: A case study of Narawala Maha Vidyalaya. Unpublished Master's thesis, University of Colombo, Sri Lanka.

Kalinowski, A., & Soane, K. (1981). The home environment and school achievement. Studies in Educational Evaluation, 7, 85-96.

Keppel, G. (1991). Design and Analysis: A Researcher's handbook. New Jersey 07632, Englewood Cliffs, Prentice Hall.

Kularatne, W. G. (1989). Organization of universal Compulsary free primary education in Sri Lanka: Analysis of its administrative problems. Unpublished manuscript, University of Colombo, Sri Lanka.

Kularatna, N. G., Dharmadasa, K. H., & Dharmawardena, H. M. K. C. (1990). Wastage in primary education in Sri Lanka: Status, patterns, and Disparities. Sri Lankan Journal of Educational Research, 1, 2, 39-88.

Longstreth, L. E., Davis, B., Carter, L., Flint, D., Owen, J., Rickert, M., & Taylor, E. (1981). Separation of home intellectual environment and maternal IQ as determinants of child IQ. Developmental Psychology, 17, 532-541.

Luster, T., & Dubow, E. F. (1992). Home environment and maternal intelligence as predictors of verbal intelligence: A comparison of pre-school and school-age children. Merrill-Palmer Quarterly, 38, 151-175.

Luster, T., & Okaguki, L. (1993). Parenting: An ecological perspective. Hillsdale, N.J: Lawrence Erlbaum.

Luster, T., & McAdoo, H. P. (1994). Factors related to the achievement and adjustment of young African American children. Child Development, 65, 1080- 1094.

Marga Institute (1981). Analytical Description of Poverty in Sri Lanka. Colombo.

Marjoribanks, K. (1979). Families and their learning environments. London: Routledge & Kegan Paul.

McLoyd. V. C. (1990). The impact of economic hardship on black families and children: Psychological distress, parenting and socioemotional development. Child Development, 61, 311-346.

National Institute of Education (1988). Entry competency of Sri Lankan children. Sri Lanka: Maharagama.

National Institute of Education (1990). Non-Formal Education for Human Resources Development. Sri Lanka: Maharagama.

Patterson, G. R., & Southammer-Loeber, M. (1984). The correlation of family management practices and delinquency. Child Development, 55, 1299-1306.

Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). Antisocial boys. Eugene, OR: Castalia.

Pellegrini, A. D., Brody, G. H., & Sigel, I. E. (1985). Parent's book-reading habits with their children. Journal of Educational Psychology, 77, 332-340.

Pettit, G. S., Bates, J. E., & Dodge, K. A. (under review). Positive parenting, ecological context, and Children's social adjustment.

Pratt, M. W., Green, D., Mac Vicar, J., & Bountrogianni. (1992). The mathematical parent: Parental scaffolding, parenting style, and learning outcomes in long-division mathematics homework. Journal of Applied Developmental Psychology, 13, 17-34.

Price, G. G. (1984). Mnemonic support and curriculum selection in teaching by mothers: A conjoint effect. Child Development, 55, 659-668.

Portes, P. R. (1991). Assessing children's cognitive environment through parent-child interactions. Journal of Research and Development in Education, 24, 3, 30-37.

Punchinilame, L. R. (1979). A study of early school leavers in backward area in Galboda Korale. Unpublished Master's thesis, University of Colombo, Sri Lanka.

Rogoff, B. & Gardner, W. (1984). Adult guidance of cognitive development. In B. Rogoff & J. Lave (Eds.), Everyday cognition: Its development in a social context (pp. 95-116). Cambridge, M.A.: Harvard University Press.

Rubin, R., Olmstead, P., Szegdon, M., Wetherby, M., & Williams, D. (1983). Long term effects of parent education follow through participation.

Rutter, M. (1978). Family, area and school influences in the genesis of conduct disorder. In L.A. Hersov, M.Berger, & D. Shaffer (Eds.) Agression and anti-social behavior in childhood and adolescence (pp. 95-113). Oxford: Pergamon Press.

Sameroff, A. J., Seifer, R., Barocas, R., Zax, M., & Greenspan, S. (1987). Intelligence Quotient scores of 4-year-old children: Social environmental risk factors. Pediatrics, 79, 343-350.

Steinberg, L., Lamborn, S. D., Darling, N., Mounts, N. S., & Dornbusch, S. M. (1994). Over-time changes in adjustment and competence among adolescents from authoritative, authoritarian, indulgent, and neglectful families. Child Development, 65, 754-770.

UNICEF, (1985). Sri Lanka: The social impact of economic policies during the last decade. Colombo: UNICEF.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Cambridge: Harvard University Press.

Wadsworth, J., Taylor, B., Osborn, A., & Butler, N. (1984). Teenage mothering: Child development at five years. Journal of Child Psychology and Psychiatry, 25, 305-313.

Werner, E. (1985). Stress and protective factors in children's lives. In A. R. Nicol (Ed.), Longitudinal studies in child psychology and Psychiatry (pp. 335-355). New York: Wiley.

Wertsch, J. V. (1979). Adult-child interactions and the roots of metacognition. Institute for Comparative Human Development, 15-18.

Wood, D. J. (1980). Teaching the young child: Some relationships between social interaction, language, and thought. In D. R. Olson (Ed.), The social foundations of language and thought. New York: Norton.

Yeates, K., MacPhee, D., Campbell, F., & Ramey, C. (1983). Maternal IQ and home environment as determinants of early childhood intellectual competence: A developmental analysis. Developmental psychology, 19, 731-739.

Table 1

Mans and Stadard Deviations for Achievement Scores

Variable	Mother Tongue		Mathematics	
	Mean	SD	Mean	SD
Norm Scores	40.61	23.96	47.57	26.07
Pre-test Scores	40.60	20.37	36.80	14.44
Post test Scores	59.46	28.85	54.48	15.95

Table 2

The t values for Achievement Scores

Variable	t	p
Mother Tongue	2.58	.016*
Mathematics	12.00	.000**

*p < .05. **p < .01.

Table 3

Means and Standard Deviations for Time with Domain Effects

	Time 1		Time 2		Time 3	
	Mean	SD	Mean	SD	Mean	SD
Family Income	5.20	1.71	9.60	2.71	14.36	4.17
Health & Nutrition	6.32	2.08	10.52	2.47	14.64	2.77
Learning facilitation	5.92	2.14	10.00	2.55	13.72	3.05
Family Interaction	8.92	2.23	11.32	2.50	13.56	2.40
Mother-child Interaction	7.80	2.02	10.56	2.08	13.76	2.07

Table 4

Anova Repeated Measures for Time, Domain and Time-Domain Interaction

	SS	df	MS	F	F
Time	3218.47	2	1609.23	712.16	.000***
Error (within cells)	108.46	48	2.26		
Domains	118.93	4	29.73	6.19	.000***
Error (within cells)	461.07	96	4.80		
Time and Domain	171.29	8	21.41	22.95	.000***
Error (within cells)	179.11	192	0.93		

***$p < .001$.

Table 5

Follow-up Analis of variance Repeated Measures for Domain effects

Time	SS	df	MS	F	F
Time 1	226.35	4	56.59	37.61	.000***
Error (within cells)	144.45	96	1.50		
Time 2	42.16	4	10.54	4.42	.003***
Error (within cells)	229.04	96	2.39		
Time 3	21.71	4	5.43	1.95	.108
Error (within cells)	266.69	96	2.78		

***p = .025.

Table 6

Follow-up Paired t values for Domains Effects Time 1 and Time 2

Time 1	t	p	Time 2	t	p
T1 D1 vs T1 D2	3.02	.006	T2 D1 vs T2 D2	2.15	.042
T1 D1 vs T1 D3	1.64	.113	T2 D1 vs T2 D3	.72	.479
T1 D1 vs T1 D4	7.67	.000***	T2 D1 vs T2 D4	3.05	.006
T1 D1 vs T1 D5	5.86	.000***	T2 D1 vs T2 D5	1.91	.068
T1 D2 vs T1 D3	2.09	.047	T2 D2 vs T2 D3	1.54	.136
T1 D2 vs T1 D4	8.22	.000***	T2 D2 vs T2 D4	2.04	.052
T1 D2 vs T1 D5	5.45	.000***	T2 D2 vs T2 D5	.13	.901
T1 D3 vs T1 D4	9.33	.000***	T2 D3 vs T2 D4	2.78	.010
T1 D3 vs T1 D5	8.32	.000***	T2 D3 vs T2 D5	1.61	.119
T1 D4 vs T1 D5	4.02	.001***	T2 D4 vs T2 D5	2.10	.046

Note. T = Time; D = Domain
***p < .005.

Table 7

Follow-up Analysis of Variance for Time Effects

Time by Domain	SS	df	MS	F	F
Domain 1	1049.36	2	524.68	167.18	.000***
Error (within cells)	150.64	48	3.14		
Domain 2	865.31	2	432.65	942.83	.000***
Error (within cells)	22.03	48	0.46		
Domain 3	761.04	2	380.52	340.59	.000***
Error (within cells)	53.63	48	1.12		
Domain 4	269.23	2	134.61	193.22	.000***
Error (within cells)	33.44	48	0.70		
Domain 5	444.83	2	222.41	383.47	.000***
Error (within cells)	27.84	48	0.58		

***p = .016.

Table 8

Follow-up Paired t values for Domain effects

Time by Domain	t	p
T1 D1 vs. T2D1	12.53	.000***
T1 D1 vs. T3 D1	14.63	.000***
T2 D1 vs. T3 D1	9.77	.000***
T1 D2 vs. T2 D2	27.50	.000***
T1 D2 vs. T3 D2	36.35	.000***
T2 D2 vs. T3 D2	22.21	.000***
T1 D3 vs. T2 D3	15.83	.000***
T1 D3 vs. T3 D3	26.50	.000***
T2 D3 vs. T3 D3	10.97	.000***
T1 D4 vs. T2 D4	11.11	.000***
T1 D4 vs. T3 D4	18.50	.000***
T2 D4 vs. T3 D4	9.33	.000***
T1 D5 vs. T2 D5	12.23	.000***
T1 D5 vs. T3 D5	24.69	.000***
T2 D5 vs. T3 D5	18.48	.000***

Note. T = Time; D = Domain.
***p = .016.

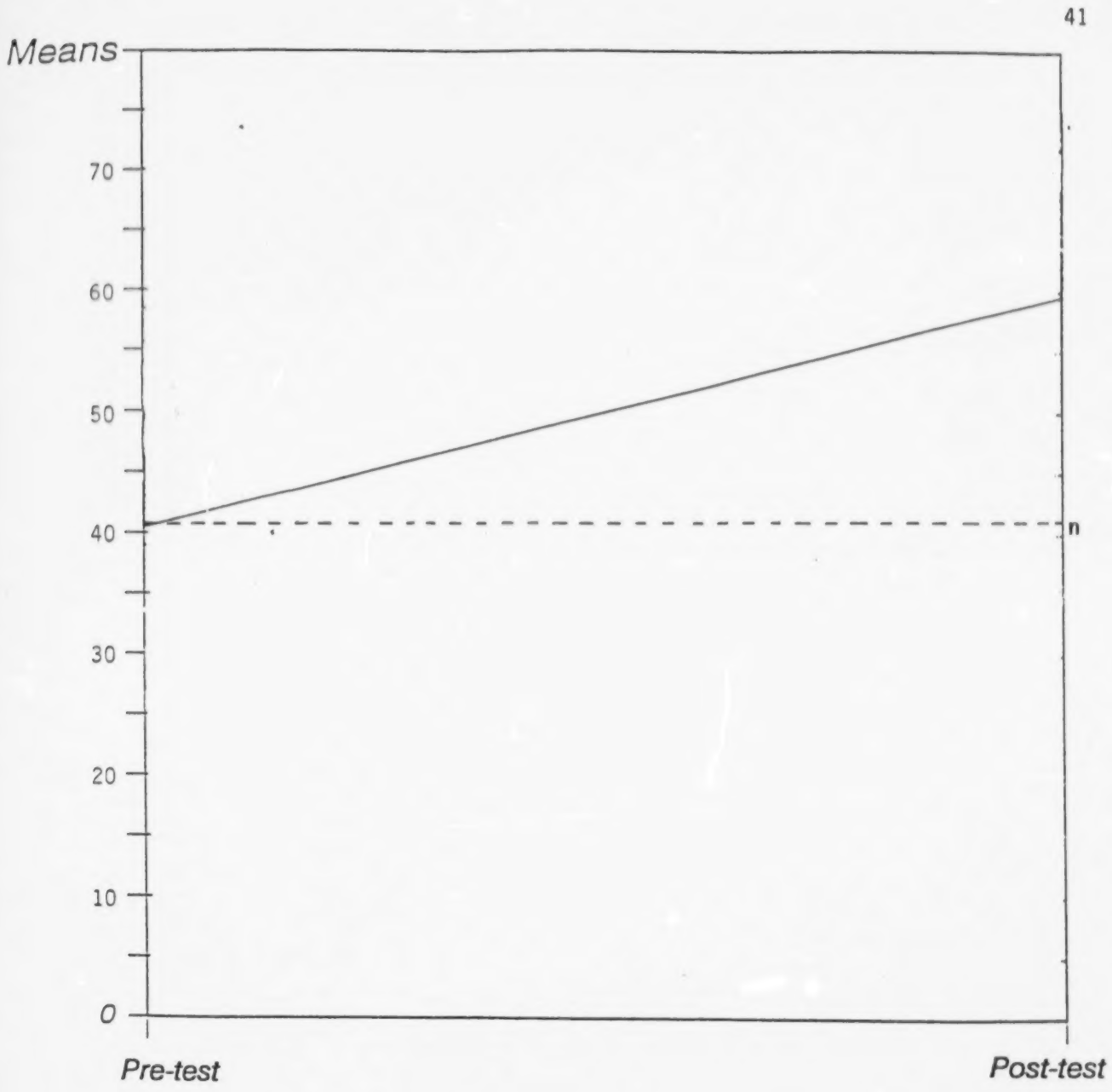

Figure 1. Mean Differences of Norm, Pre-test and Post-test

Mother tongue scores

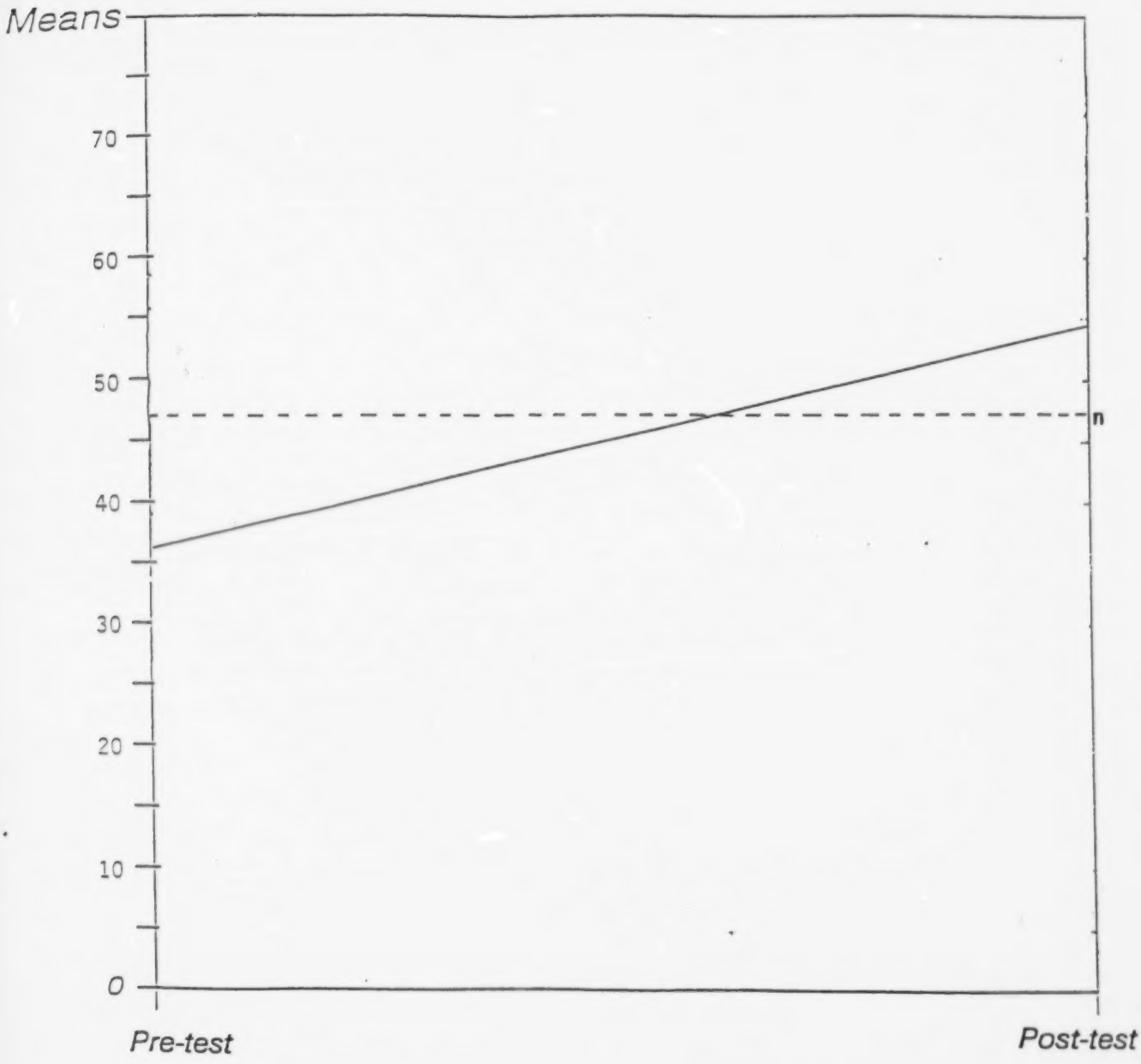

Figure 2. Mean Differences of Norm, Pre-test and Post-test Mathematics scores

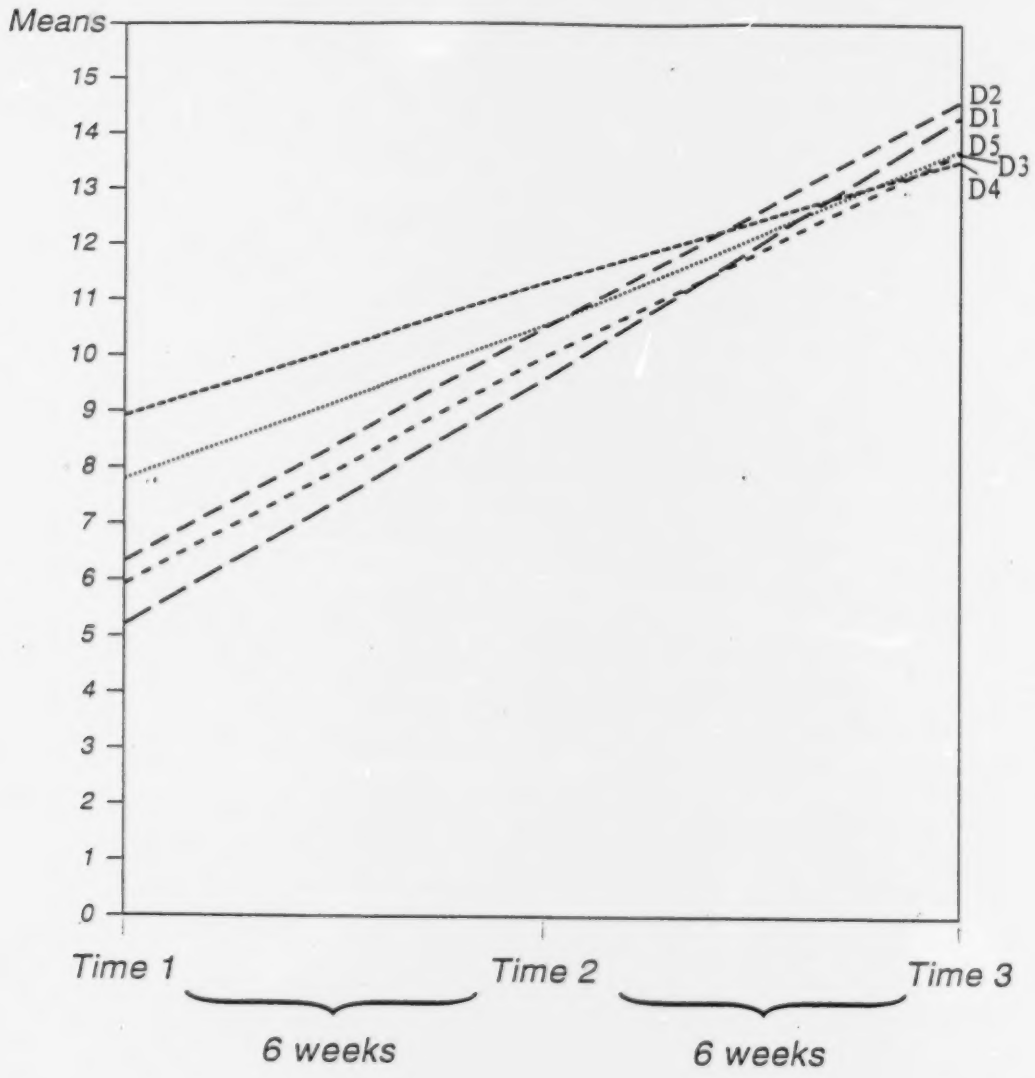

Figure 3. Time by Domain Interaction

D1 Family income
D2 Health and nutrition
D3 Learning facilitation
D4 Family interaction
D5 Mother-children interaction